

**CLAIMS:**

1. A method for synthesis of a substrate-selective  
5 membrane comprising: (a) polymerising a mixture  
comprising a template, at least one functional  
monomer, cross-linker, plasticiser and pore-forming  
component; and (b) extracting the template and  
porogen to form a flexible and porous polymeric  
10 membrane.
2. A method according to claim 1 wherein conditions are  
selected so that the membrane contains small (< 100  
nm in diameter) and large (> 500 nm in diameter)  
pores.
- 15 3. The method of claim 1 or claim 2 wherein conditions  
are selected so that the film has a porosity of from  
about 25 to 90%.
4. The method of any preceding claim wherein the  
monomers and/or cross-linker comprise one or more of  
20 vinyl, allyl, styrene, acrylic and methacrylic  
derivatives, and mixtures thereof.
5. The method of any preceding claim wherein the  
plasticiser is selected from oligourethane acrylate,  
butadiene rubber, polyurethane, and caoutchoucs.
- 25 6. The method of any preceding claim wherein the pore-  
forming component is selected from aliphatic

hydrocarbons, aromatic hydrocarbons, esters, alcohols, ketones, ethers, solutions of soluble polymers, and mixtures thereof.

7. The method of claim 6 wherein the pore-forming component comprises one or more of; (a) soluble polymers selected from non cross-linked polymers or copolymers of monomers selected from styrene, ring-substituted styrene, acrylates, methacrylates, dienes, vinylchloride, vinylacetate, polyvinyl chloride, and polyethylene glycol; (b) glycerol; (c) cyclohexanol, and (d) mineral oil.
8. The method of any of claims 1-5 wherein the pore-forming component comprises insoluble macroporous polymer particles.
9. The method of claim 8 wherein said particles are cross-linked copolymers of monomers selected from vinyl, allyl, styrene, acrylic and methacrylic derivatives.
10. The method of claim 8 or claim 9 wherein said particles have diameters in the range 1-1000  $\mu\text{m}$ .
11. The method of any of claims 1-5 wherein the pore-forming component is an inorganic porogen.
12. The method of claim 11 wherein the porogen comprises  $\text{MgCl}_2$ ,  $\text{Mg}(\text{ClO}_4)_2$ ,  $\text{ZnCl}_2$ ,  $\text{Ca Cl}_2$ ,  $\text{SiO}_2$ ,  $\text{NaNO}_3$ ,  $\text{NaOCOCH}_3$  and/or  $\text{NaCl}$ .

13. The method of any preceding claim including a further step of using the membrane as a separation matrix.
14. The method of claim 12 wherein said separation  
5 matrix is used for membrane chromatography, or for a catalytic, diagnostic, or absorption process.
15. A substrate-selective membrane as produced by the method of any of claims 1-11.
16. Use of a membrane according to claim 15 as a  
10 separation matrix.